**Amazing Race**

A WebQuest for 7th Grade Science

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**Introduction** [**Return To Top**](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/amazingRace.htm#ReturnTo)

You are a participant in the challenge of travelling with “Heat & Temperature Technologies.” In order to win a make your own pizza at Kidds’ fabulous foods lab you must successfully travel from Red Deer to Toronto. .There will be some challenges along the way for you to complete before you reach your final destination. (This is a race the first team (four members) to fully complete all seven tasks will be the winners of the pizza.)

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Seven challenges must be mastered in order for you to complete your journey.

**The Process** [**Return To Top**](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/amazingRace.htm#ReturnTo)

Open The Amazing Race Web Quest Worksheet (Microsoft Word) to record your answers to all seven challenges.

**Challenge 1:** You are travelling from Red Deer to Moose Jaw by “Greyhound Bus.” It is 25 degrees Celsius in the morning and it is supposed to reach a high of 38 degrees Celsius by early afternoon. Around 3:00 pm the bus driver starts to sway back and forth on the highway until finally he screeches to the side of a road. He notices he has a flat tire, however, there is no debris found in or around the tire. Using the particle theory, explain what might have happened!

**Challenge 2:** Since the bus will take a few hours to repair you are desperately looking for a quicker ride. Out in a farmers field is a young gentleman just about to get into a HOT AIR BALLOON. You ask him for a ride to Moose Jaw.

a. Before you can get in you need to explain how convection works in case you are needed to pilot the balloon. Using the diagram at this [Challenge 2](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/Challenge2.doc) fill in the boxes using the following words; heat source, less dense air particles, more dense air particles.

b. Answer the questions on the Challenge 2 linked page above.

**Challenge 3:** The hot air balloon stops in Moose Jaw. You thank the gentleman and go on your way. About 30 minutes later you take a break to take a drink of hot chocolate from your thermos. You start to wonder how a thermos works. See the **thermos diagram** **page** and explain in a paragraph, in your own words, how a thermos uses conduction, convection and radiation to keep your hot chocolate hot. Also label the diagram of the thermos using the following words; screw top, vacuum, outer shell, contents, silvered glass.

[**http://home.howstuffworks.com/thermos.htm**](http://home.howstuffworks.com/thermos.htm)

**Challenge 4:** After you have warmed up from your hot chocolate you are wondering what the temperature outside is. The problem is you do not have a thermometer with you. Use the following site to explain how to make your own thermometer.

<http://www.weatherwizkids.com/experiments-thermometer.htm>

<http://www.ehow.com/how_4867474_make-thermometer-kids.html>

**Challenge 5:** After you have found out the temperature outside you decide to keep walking down the highway where you eventually get picked up by a man going to Winnipeg. Just outside of Winnipeg you come across a huge brush fire. You get out of the car and feel the heat from the fire and start moving away. Explain in two or three sentences how a fire demonstrates all three forms of heat transfer.

<http://www.wisc-online.com/Objects/ViewObject.aspx?ID=sce304>

**Challenge 6:** What is the formula to convert degrees Kelvin into degrees Celsius, and inches to centimetres.

**Celsius and Kelvin:**

**Kelvin = Celsius + 273.15 Celsius = Kelvin -273.15**

**Celsius and Fahrenheit: Celsius = 5/9 x (Fahrenheit -32) Fahrenheit = ( Celsius/(5/9)) + 32**

**convert inches to centimeters. ... Note: 1 Inch = 2.54 cm**

**Challenge 7:** After helping the fire department put out the grass fire you decide to hop a train going East. After a long journey it comes to a sudden stop due to a break in the track. You have arrived in Toronto where the temperature is around –11 degrees Celsius. The foreman is unsure of how far to space the rail apart in order to compensate for the expansion and contraction of the rail. Use the information and the chart from the website provided to find the correct distance the foreman needs to space the rail. (be careful, the chart states temperature in degrees Fahrenheit) **Show all work.**

<http://www.catskillarchive.com/rrextra/tkwk04.Html>

**Evaluation** **[Return To Top](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/amazingRace.htm" \l "ReturnTo)**

Your mark will be determined using the following rubric.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **TASK** | **Beginning**  **1** | **Developing**  **2** | **Accomplished**  **3** | **Exemplary**  **4** | **Score** |
| 1 | Explanation is poor, rarely relating to the particle theory | Reference to the particle theory is weak only one or two points are explained. | Student shows good understanding of particle theory with only a few mistakes. | Explanation is excellent, students shows full understanding of the particle theory. |  |
| 2 | Explanation is poor, rarely relating to the particle theory. Labeling is incorrect. | Reference to the particle theory is weak only one or two points are explained. One label is correct. | Student shows good understanding of particle theory with only a few mistakes. Only one label is incorrect. | Explanation is excellent, students shows full understanding of the particle theory. Labels all correct. |  |
| 3 | Explanation is poor, rarely referring to convection, conduction and radiation. Labeling is incorrect. | Student sometimes refers to convection, conduction and radiation in explanation. Some labeling is incorrect. | Explanation is good referring to convection, conduction and radiation often. Most labeling is correct. | Explanation is excellent referring to convection, conduction and radiation often. All labeling is correct. |  |
| 4 | Explanation is poor, students does not explain how to make a thermometer. Instructions very unclear. | Student explains some of the parts in making a thermometer, but has missed some important points. | Explanation in making a thermometer is good, only missing a few key points. | Explanation in making a thermometer is excellent, very clear instructions all key points included. |  |
| 5 | Student does not explain where convection, conduction, and radiation occur in the fire. | Explanation is weak, student misses explaining two of the three types of heat transfers in the fire. | Explanation is good. Student explains all three types of heat transfer with only minor mistakes. | Explanation is excellent. Student explains all three types of heat transfer with no mistakes. |  |
| 6 | No formulas shown | Both formulas are shown but many of the variables are incorrect. | Both formulas are shown with one or two minor mistakes shown. | Both formulas shown no mistakes. |  |
| 7 | Student shows no understanding on how to come up with the correct distance. No work shown. | Student show some work in getting an answer but many mistakes are present. | Student gets proper answer with only minor mistakes in work shown. | Student get the correct answer with no mistakes in work shown. |  |
|  |  |  |  | **Total** |  |

**Conclusion** [**Return To Top**](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/amazingRace.htm#ReturnTo)

Congratulations, how have successfully traveled across Canada. You have not only seen the great landscape of Canada but you also have learned about heat and temperature.

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ICT Outcomes

C1 Students will access, use and communicate information from a variety of technologies. (3.1, 3.2, 3.3, 3.4, 3.5,)

C4 Students will use organizational processes and tools to manage inquiry. (3.3)

C6 Students will use technology to investigate and/or solve problems. (3.3)

**Credits & References** [**Return To Top**](http://www2.mhcbe.ab.ca/ict/Projects/AmazingRace/amazingRace.htm#ReturnTo)